MATHS

BOOKS - RS AGGARWAL MATHS (HINGLISH)

LINEAR EQUATIONS IN TWO VARIABLES

Solved Examples

1. Write each of the following equations in the form $ax + by + c = 0$ and indicate the values of a,b,c in each case. (i) $3 = 2x + y$

(ii) $3x - 8 = 5y$

(iii) $x = 4y$

(iv) $\dfrac{x}{3} - \dfrac{y}{2} = 5$

(v) $4y - 3 = \sqrt{2}x$

(vi) $\pi x + y = 6$

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2. Write each of the following as an equation of the form $ax + by + c = 0$ and write the values of a,b,c in each case.

(i) $x = -3$

(ii) $y = 5$

(iii) $3x = 2$

(iv) $5y = 4$

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3. Show that x=3 and y=2 is a solution of the linear equation $2x + 3y = 12$.

4. Check which of the following are solutions of the equations $x - 2y = 4$ and which are not :

(i) $(0, 2)$ (ii) $(2, 0)$ (iii) $(4, 0)$ (iv) $\left(\sqrt{2}, 4\sqrt{2}\right)$ (v) $(1, 1)$

5. Find four different solutions of the equation

$x + 2y = 6.$

6. Find the value of k, if $x = 2, y = 1$ is a

solution of the equations $2x + 3y = k.$

7. If $x = 2k - 1$ and $y = k$ is a solution the equation $3x - 5y - 7 = 0$; find the value of k.

8. Draw the graph of the equation $2x - y + 3 = 0$. Using the graph, find the value of y when (a) x=2, (b) x=-3.

9. Draw the graph of the equation $2x + 3y = 11$. From your graph, find the value of y when $(a)\, x = 7$, $(b)\, x = -8$.

10. Draw the graph of the equation $2x + 3y = 6$. From the graph, find the value of y, when

(i) $x = \dfrac{3}{2}$ (ii) $x = -3$.

11. A taxi charges .Rs 20 for the first kilometre and @12 .Rs per km for subsequent distance covered. Taking the total distance covered as x km and total fare .Rs y, write a linear equation depicting the relation between x and y. Draw the graph between x and y.

Form your graph, find the taxi charges for covering

(a) 12 km and (b) 20 km.

12. There are two scales of measuring the temperature, namely degree Fahrenheit $(.^\circ\ F)$ and degree Celsius $(.^\circ\ C)$. The relation between the two scales is given by, $F = \dfrac{9}{5}C + 32.$

(i) If the temperature is $0^\circ C$, what is the temperature in Fahrenheit?

(ii) If the temperature is $50^a C$, What is the temperature in Fahrenheit ?

(iii) If the temperature is $50^\circ C$, what is the temperature in Fahrenheit ?

(iii) If the temperature is $86^\circ F$, what is the

temperature in Celsius ?

(iv) If the temperature is $0°F$, what is the temperature in Celsius ?

(v) Find the numerical value of the temperature which is the same in both the scales.

(vi) Draw the graph of the linear equation $F = \dfrac{9}{5}C + 32$, taking C along the x-axis and F along the y-axis.

(vii) Using the graph, fill in the blanks given below:

$-5°C = (......)°F$ and $14°F = (......)°C.$

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13. If the temperature of a liquid can be measured in kelvin units as $x°K$ or in fahrenheit units as $y°F$, the relation between the two systems of measurement of temperature is given by the linear equation.

$$y = \frac{9}{5}(x - 273) + 32$$

(i) find the temperature of the liquid in fahrenheit, if the temperature of the liquid is 313 K.

(ii) If the temperature in kelvin.

14. If the work done by a body on application of a constant force is directly proportional to the distance travelled by the body, express this in the form of an equation in two variables and draw the graph of the same by taking the constant force as

15. The force exerted to pull a cart is directly proportional to the acceleration produced in the body. Express the statement as a linear equation of two variable and draw the graph of the same by taking the constant mass equal to 6 kg. Read from the graph the force required when the acceleration produced is

(i) $5m/s^2$ (ii) $6m/s^2$.

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Exercise 4 A

1. Express each of the following equations in the form $ax + by + c = 0$ and indicate the values of a,b,c in each case.

(i) $3x + 5y = 7.5$ (ii) $2x - \dfrac{y}{5} + 6 = 0$

(iii) $3y - 2x = 6$ (iv) $4x = 5y$

(v) $\dfrac{x}{5} - \dfrac{y}{6} = 1$ (vi) $\sqrt{2x} + \sqrt{3y} = 5$

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2. Express each of the following equations in the form $ax + by + c = 0$ and indicate the

values of a,b,c in each case. (i) $x = 6$ (ii)

$3x - y = x - 1$ (iii) $2x + 9 = 0$ (iv) $4y = 7$ (v)

$x + y = 4$ (vi) $\dfrac{x}{2} - \dfrac{y}{3} = \dfrac{1}{6} + y$

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3. Check which of the following are the

solutions of the equation $5x - 4y = 20$.

(i) $(4,0)$ (ii) $(0,5)$ (iii) $\left(-2, \dfrac{5}{2} \right)$

(iv) $(0, -5)$ (v) $\left(2, -\dfrac{5}{2} \right)$

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4. Find five different solutions of each of the following equations:

(a) $2x - 3y = 6$ (b) $\dfrac{2x}{5} + \dfrac{3y}{10} = 3$ (c) $3y = 4x$

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5. If $x = 3$ and $y = 4$ is a solution of the equation $5x - 3y = k$, find the value of k.

A. $k = -3$

B. $k = 3$

C. $k = 4$

D. $k = -4$

Answer: B

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6. If $x = 3k + 2$ and $y = 2k - 1$ is a solution of the equation $4x - 3y + 1 = 0$, find the value of k.

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7. The cost of 5 pencils is equal to the cost of 2 ballpoints. Write a linear equation in two variables to represent this statement. (Take the cost of a pencil to be Rs. x and that of a ballpoint to be Rs. y).

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Exercise 4 B

1. Draw the graph of each of the following equations.

(i) $x = 4$ (ii) $x + 4 = 0$ (iii) $y = 3$

(iv) $y = -3$ (v) $x = -2$ (vi) $x = 5$

(vii) $y + 5 = 0$ (viii) $y = 4$

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2. Draw the graph of the equation y=3x.

Form your graph, find the value of y when (i) x=2 (ii) x=-2.

3. Draw the graph of the equation $x + 2y - 3 = 0$.

From your graph, find the value for y when (i) x=5 (ii) x=-5.

4. Draw the graph of the equation, $2x - 3y = 5$.

From your graph , find (i) the value of y when x=4 and (ii) the value of x when y=3.

5. Draw the graph of the equation, $2x + y = 6$ find the coordinates of the point where the graph cuts the x-axis.

6. The graph of the linear equation 2x+3y=6 cuts the Y-axis at the point

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7. Draw graphs of the equation : $3x - 2y = 4$ and $x + y - 3 = 0$ in the same graph and find the coordinates of the point where two lines intersect.

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8. Draw the graph of line $4x + 3y = 24$

Write the coordinates of points where this line intersects the x-axis and y-axis.

Use this graph to find the area of the triangle formed by the line and the coordinates axes.

9. Draw the graphs of $2x + y = 6$ and $2x - y + 2 = 0$. Shade the region bounded by these lines and x-axis. Find the area of the shaded region.

10. Draw the graphs of the equations $x - y = 1$ and $2x + y = 8$. Shade the area bounded by these two lines and y-axis. Also, determine this area.

11. Draw the graph for each of the equations $x + y = 6$ and $x - y = 2$ on the same graph

paper and find the coordinates of the point where the two straight lines intersect.

12. Two students A and B contributed .Rs 100 towards the Prime Minister's Relief Fund to help the earthquake victims. Write a linear equation to satisfy the above data.

A. $x - y = 100$

B. $x + y = 100$

C. $2x + y = 100$

D. $x + 2y = 100$

Answer: B

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1. The equation of the $x -$ axis is

A. $(x = 0)$

B. $y = 0$

C. $x = y$

D. $x + y = 0$

Answer: B

2. The equation of the y-axis is

A. x=0

B. y=0

C. x=0

D. $x + y = 0$

Answer: A

3. The point of the form (a, a) always lies on

A. the $x -$ axis

B. the $y -$ axis

C. the line $y = x$

D. the line $x + y = 0$

Answer: C

4. The point of the form $(a,-a), a \neq 0$ lies on

    A. the x-axis

    B. the y=axis

    C. the line y=x

    D. the line $x + y = 0$

Answer: D

5. The linear equation $3x - 5y = 15$ has

    A. a unique solution

    B. two solutions

    C. infinitely many solutions

    D. no solution

Answer: C

6. The equation 2x+5y=7 has a unique solution,

if x and y are

    A. natural numbers

    B. rational numbers
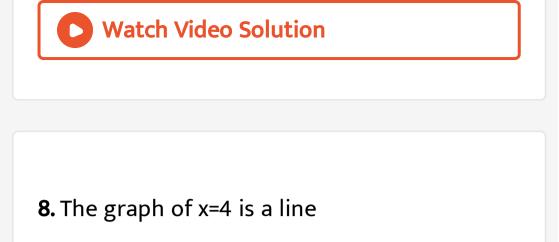
    C. positive real numbers

    D. real numbers

Answer: A

7. The graph of $y = 5$ is a line

    A. making an intercept 5 on the $x -$ axis

    B. making an intercept 5 on the $y -$ axis

    C. parallel to the $x -$ axis at a distance of 5

       units from the origin

    D. parallel to the $y -$ axis at a distance fo 5

       units from the origin
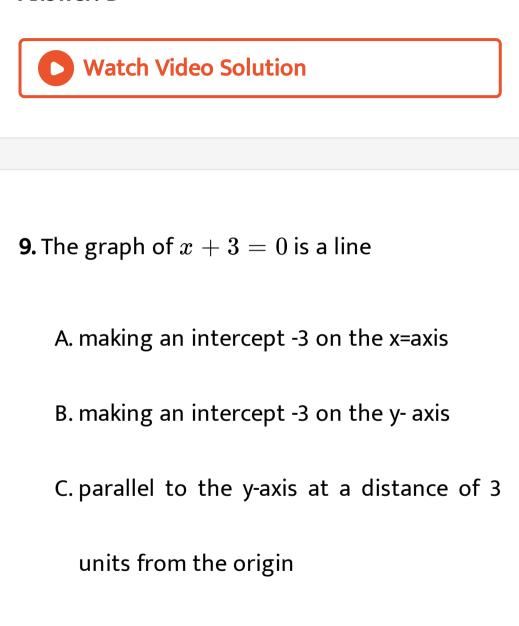
Answer: C

8. The graph of x=4 is a line

A. making an intercept 4 on the x=axis

B. making an intercept 4 on the y- axis

C. parallel to the x-axis at a distance of 4

units from the origin

D. parallel to the y-axis at a distance fo 4

units from the origin

Answer: D

9. The graph of $x + 3 = 0$ is a line

    A. making an intercept -3 on the x=axis

    B. making an intercept -3 on the y- axis

    C. parallel to the y-axis at a distance of 3

       units from the origin

D. parallel to the x-axis at a distance fo 3

units from the origin

Answer: C

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10. The graph of $y + 2 = 0$ is a line

A. making an intercept -2 on the x=axis

B. making an intercept -2on the y- axis

C. parallel to the x-axis at a distance of 2

units from the origin

D. parallel to the y-axis at a distance fo 2

units from the origin

Answer: C

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11. The graph of the linear equation

$2x + 3y = 6$ cuts the $Y -$ axis at the point

A. $(2, 0)$

B. $(3, 0)$

C. $(0, 2)$

D. $(0, 3)$

Answer: C

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12. The graph of the linear equation

$2x + 5y = 10$ meets the x-axis at the point

A. (0,2)

B. (2,0)

C. (5,0)

D. (0,5)

Answer: C

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13. The graph of the line x=3 passes through

the point

A. (0,3)

B. (2,3)

C. (3,0)

D. none of these

Answer: C

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14. The graph of the line y=3 passes through

the point

A. (3,0)

B. (3,2)

C. (2,3)

D. none of these

Answer: C

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15. The graph of the line $y = -3$ does not

pass through the point

A. $(2, \, - 3)$

B. $(3, \, - 3)$

C. $(0, \, - 3)$

D. $(- 3, 2)$

Answer: D

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16. The graph of the linear equation y=x passes through the point

A. $\left(\dfrac{-1}{2}, \dfrac{1}{2} \right)$

B. $\left(\dfrac{3}{2}, \dfrac{-3}{2} \right)$

C. $(0, \ -1)$

D. $(1, 1)$

Answer: D

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17. If a linear equation has solutions $(-2, 2)$, $(0, 0)$ and $(2, \ -2)$, then it is of the form

A. $x - y = 0$

B. $x + y = 0$

C. $-x + 2y = 0$

D. $x - 2y = 0$

Answer: B

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18. How many linear equations can be satisfied

by $x = 2$ and $y = 3$?

A. only one

B. only two

C. only three

D. infinitely many

Answer: D

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19. A linear equation in two variables x and y is

of the form $ax + by + c = 0,$ where

A. $a \neq 0, b \neq 0$

B. $a \neq 0, b = 0$

C. $a = 0, b \neq 0$

D. $a = 0, c = 0$

Answer: A

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20. If $(2, 0)$ is a solution of the linear equation

$2x + 3y = k$, then the value of k is

A. 6

B. 5

C. 2

D. 4

Answer: D

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21. Any point on the $X -$ axis is of the form

A. (x, y)

B. $(0, y)$

C. $(x, 0)$

D. (x, x)

Answer: C

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22. Any point on the y- axis is of the form

A. (x,y)

B. (0,y)

C. (x,0)

D. (y,y)

Answer: B

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23. $x = 5$ and $y = 2$ is a solution of the linear

equation

    A. $x + 2y = 7$

    B. $5x + 2y = 7$

C. $x + y = 7$

D. $5x + y = 7$

Answer: C

24. If the point $(3, 4)$ lies on the graph of

$3y = ax + 7$, then find the value of a.

A. $\dfrac{2}{5}$

B. $\dfrac{5}{3}$

C. $\dfrac{3}{5}$

D. $\dfrac{2}{7}$

Answer: B

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